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A Test of the 'State' Versus 'Non-State' Views of Hypnotic Behavior.

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VIEWS OF HYPNOTIC BEHAVIOR.

The Louisiana State University and
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A TEST OF THE "STATE" VERSUS "NON-STATE" VIEWS
OF HYPNOTIC BEHAVIOR

A Dissertation

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Louisiana State University and
Agricultural and Mechanical College
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Doctor of Philosophy

in

The Department of Psychology

by
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ABSTRACT

The present study sought to determine the importance of the trance "state" as an explanatory concept in hypnosis. Ss of high and low hypnotic susceptibility were presented a suggestion both before and after a hypnotic induction procedure in a counterbalanced design. Ss served as their own controls in the two phases of suggestion-induction presentation. The order of the induction procedure determined whether or not S received the suggestion while in a trance "state."

Ss of low hypnotic susceptibility failed, as predicted, to comply with the suggestion irrespective of the order condition. High susceptibility Ss initially receiving the suggestion before induction and then in reverse order responded positively to both presentations. High susceptibility Ss who initially received the suggestion after induction and then in reverse order responded positively only to the initial presentation. Ss' responses appeared to be determined by whether or not they initially learned that a trance "state" was necessary for compliance with the suggestion. The results were taken as supportive of "non-state" theory and Ss' responses to suggestions were explained in terms of demand characteristics and antecedent variables.

INTRODUCTION

Historical Overview

The modern history of hypnotism is traced by Hull (1933), Marks (1947), and LeCron and Bordeaux (1949), from the time of the Viennese physician, Franz Anton Mesmer. In the early 1770's, Mesmer had observed the remarkable faith cures obtained by two Jesuit priests, Father Maximillian Hell and Father Ganzer or Gassner. These two priests, following theories proposed by an alchemist-physician named Paracelus that a wonder-working and beneficial magnetic fluid surrounds the earth, used magnets to effect their cures. In 1776, Mesmer proposed his theory of animal magnetism in his medical dissertation. He stated that the human body was influenced by the planets and was divided into two halves which acted like the poles of an animal magnet. Disease was thought to result from an imbalance of magnetic fluid between the two poles of the body. It apparently occurred to Mesmer that a magnet could convey the universal fluid into the patient's body thus restoring the balance of magnetic fluid between the body's poles and effecting a cure. Mesmer believed this process could also take place indirectly by his "magnetizing" an object which could then impart the magnetic fluid if touched. Mesmer established a clinic in Paris in 1778 and began to treat all kinds of diseases with his technique of animal magnetism or mesmerism, as it came to be called. In order to accommodate the overflow of patients who clamored

for his services, Mesmer developed the "baquet," a round, water-filled tub containing "magnetized" glass or iron filings. Up to thirty patients could sit around the "baquet" grasping iron rods which protruded from the tub. Mesmer, dressed in flowing robes, would make occasional appearances in the darkened room containing the "baquet" either to touch or to fix his gaze on the patients. The patients would experience a convulsive seizure called a "crisis" when sufficiently magnetized and would then be cured.

In 1784, at the demand of Mesmer's fellow physicians, the French government appointed a commission to conduct an official inquiry into Mesmer's claims and work. The commission's report more or less branded Mesmer as a fraud and shortly thereafter he went into virtual retirement in Switzerland.

Mesmer's theories were kept alive and expanded upon by some of his students following his withdrawal from practice. The Marquis de Puységur began to experiment in 1784 with subjects who had never been exposed to Mesmer's work or to demonstrations of convulsive "crisis." He found these naive subjects going into a sleeping trance condition which he labeled somnambulism. Upon awakening, subjects reported amnesia for the trance state. This sleeping trance attracted a great deal of attention as de Puységur claimed that persons in such a state had clairvoyant powers, manifested especially in their ability to make difficult medical diagnoses. Along with the physician, Dr. Ostertag, de Puységur founded the "school of experimentalists" for the study of animal magnetism.

Another of Mesmer's followers, the Chevalier Tardy de Montreval, led a second magnetic splinter group, the "Spiritists" or "Animists," which insisted that the cures of Mesmer and de Puységur were determined by divine grace. Tardy de Montreval believed that man had a sixth sense which he conceived of as functioning as kind of a visceral radar or x-ray. He insisted, for example, that one of his subjects could not only diagnose diseases, but could actually see through patients. Needless to say, de Montreval's ideas added considerably to the air of mysticism and charlatanism which surrounded the practice of mesmerism.

Also in 1784, Pététin, a physician at Lyons, described the phenomenon of hypnotic catalepsy or muscular immobility.

Experiments by the Abbe Jose Custudio de Faria between 1814 and 1818 led him to the discovery that the determining cause of the "somnambulistic" state lay within the subject and not within the "magnetizer," as had previously been thought. The chief characteristic of good somnambulistic subjects was held to be "psychic impressionability" (suggestibility). In 1819, Alexandre Bertrand, having been influenced by the Abbe Faria's work, proposed that somnambulism was not the end product of "animal magnetism" but was due, rather, to a psychosomatic response to applied suggestion.

By 1825, hypnotically induced positive hallucinations, negative hallucinations, hypnotic anesthetics, hypnotic analgesias, and post-hypnotic suggestion had all been discovered and described by various experimenters. From 1825 to about 1860, the Baron du Potet helped to

organize Mesmer societies throughout France and he also established the journal, "Traite du Magnétisme Animal," which became the chief organ of magnetism.

In December of 1825 and again in 1831, the French government, on both occasions at the request of the magnetizers, appointed commissions to re-examine mesmerism in the light of new discoveries. The magnetic demonstrations presented to these commissions were complete failures and the practice of mesmerism again lost standing in France.

In 1829, John Elliotson, a prominent professor of medicine at London University learned of mesmerism through a student of the Abbe Faria. He became convinced that "magnetic sleep" could be utilized effectively as an anesthetic agent. Elliotson's endorsement of mesmerism resulted in his being forced to leave the university and rendered him more or less a medical pariah.

James Esdaile, a Scottish physician practicing in India, performed the first surgery using magnetic sleep as an anesthetic agent in 1845. Esdaile went on to perform several thousand such operations and established himself as the most important advocate of the new painless surgery. Other physicians began to follow suit. Dr. Guerneau of Portiers and Dr. Loysel of Cherbourg amputated the leg of a mesmerized patient in 1846 without causing pain. In 1847, Drs. Ribaud and Kiario removed a tumor from the jaw of a mesmerized patient and in 1859, Drs. Broca and Follin used mesmerism as an anesthetizing agent for lancing a rectal abscess.

James Braid, an English physician, more or less brought the

age of the animal magnetizers to a close with the publication of his "Neurypnology or the Rationale of Nervous Sleep" in 1843. In this paper, Braid demonstrated that all the phenomena attributed to mesmerism were obtainable through simple suggestion. Braid demonstrated that "trance states" could be induced in cooperative subjects by having them fix their gaze on a given object thereby causing eye strain while, at the same time, they listened to the soft-spoken, repetitive suggestions of the hypnotist. Braid coined the name "hypnotism," a term he came to consider as somewhat of a misnomer after he discovered in 1847 that all the major phenomena of the trance state could be induced without sleep.

Liébeault became interested in mesmerism around 1860 and in 1864 he opened a clinic in Nancy, France, where he administered hypnotic suggestion therapy free of charge. Liébeault's treatment consisted of giving countersuggestions for the various ailments presented by patients.

Charcot, working independently of Liébeault, had attracted considerable attention by 1880 through his lectures and experiments on hypnosis. Along with his students, Binet and Féré, Charcot conducted a series of poorly controlled experiments which resulted in his rejecting the notion of suggestion as an explanation of hypnosis and reviving the theory of animal magnetism. A controversy developed between the Nancy and Paris schools which was finally laid to rest in 1902 with the publication of "Suggestive Therapeutics" by a friend and colleague of Liébeault, Hippolyte Bernheim. Bernheim's book exposed

the methodological errors of the Charcot-Binet-Féré studies and negated their findings with scientific evidence. In 1910, Emile Coué, who had studied with Liébeault, established the "Neo-Nancy" school which advocated abandonment of the trance and depended instead on waking suggestion (termed "autosuggestion") to effect cures.

Sigmund Freud observed Charcot's work with hysterics while studying in Paris in 1885 and in 1889 he visited Nancy where he studied Liébeault's hypnotic therapy. Freud was influenced most strongly, however, by Josef Breuer, a physician he had met in Vienna. Breuer did not use countersuggestion as a technique. Rather, he used hypnosis to enable patients to recall and discharge emotions associated with past experiences or with fantasies (the so-called "cathartic method"). As Freud began to develop his psychoanalytic theory, he abandoned Breuer's technique because it was unsuccessful with some patients and also because he considered hypnosis incapable of penetrating the repressed memories seen as constituting the core of neurosis.

In the United States, Phineas Quimby was probably one of the best known early practitioners of hypnotism. In 1862, he successfully treated Mary Baker Eddy for a neurotic condition. Although Quimby had made no religious claims for his method, Mrs. Eddy, in founding the Christian Science religion, warned her followers to beware of "malicious animal magnetism, hypnotism and suggestion" (LeCron et al., 1949). Morton Prince did some important pioneer work on hypnosis in the early 1900's.

In retrospect, the period of greatest early interest in

hypnosis was probably from about 1885 to 1910 owing to the well-publicized controversy between Liébeault's Nancy and Charcot's Paris schools. The medical profession's failure to grant hypnosis acceptance as a therapeutic agent caused interest to wane thereafter except for a brief resurgence following its successful application to the treatment of war neuroses following World War I. Freud's subsequent rejection of hypnosis and the popularity of psychoanalytic theory led to another eclipse of interest until Clark Hull's controlled laboratory studies in the early 1930's began to grant hypnosis scientific status and an aura of respectability.

Theories of Hypnosis

Psychoanalytic Theories

Kubie and Margolin (1944) made a clear distinction between the hypnotic induction process and the established hypnotic state. They delineated three stages of hypnosis which were viewed as shading into one another. The first stage (induction) was seen as a condition of partial sleep in which sensory-motor relationships between the subject and the environment became progressively eliminated until the hypnotist became the sole representative of the outside world. In this stage, the sensory-motor relationships of the subject to the outside world are similar to those of the infant and the hypnotist plays the role of parent. The subject's ego boundaries are constricted in the second stage as a result of the reduced sensory-motor stimulation. A psychic incorporation occurs between the subject and hypnotist such that the

hypnotist's words become indistinguishable from the subject's thoughts. In the final stage of hypnosis a partial reexpansion of the subject's ego boundaries takes place with a fragmentary image of the hypnotist remaining incorporated within these boundaries. Free communication with the outside world is possible in this stage with the hypnotist's voice and will functioning as an unconscious component of the subject's behavior. This stage was viewed as paralleling the phase of ego development during which the infant's ego boundaries expand to incorporate parental images as unconscious components of the ego. Immobility, monotony, sensory adaptation, and rhythm were seen as necessary factors in reducing the subject's ego defenses such that hypnotic induction could occur.

Gill and Brenman (1961) viewed hypnosis as an altered state of consciousness and described the hypnotic induction process as regression in service of the ego. Similarly to Kubie and Margolin, they conceived of hypnosis as paralleling a natural process of development. During the course of development, the infant's ego begins to gain a relative degree of autonomy from environmental stimuli and id impulses which do not present a danger to the organism. A reduction of input from environment or id or a strong environmental stimulus or id impulse results in a decreasing of the ego's relative autonomy. The monotonous, repetitive nature of the hypnotic induction process was viewed as diminishing environmental stimulation while at the same time the hypnotist was exerting strong pressure on the subject. The subject's compliance with the hypnotist's demands was seen as creating a

subsystem within the ego which regressed to an earlier developmental stage of decreased autonomy from environmental and id input. Only this ego subsystem was viewed as being under the hypnotist's control and the subject could regain control at any time.

Experimental evidence for the psychoanalytic theories of hypnosis as stated by Kubie and Margolin (1944), "is only fragmentary because it has never been sought systematically." The psychoanalytically oriented theorists believe that an extensive carry-over occurs from prehypnotic relationship into content of the hypnotic state, comparable to the carry-over into dream content of residues of emotionally incomplete experiences of the day. Studies of dreams in hypnosis, such as that of Farber and Fisher (1943), which demonstrate this phenomenon are taken as evidence of the hypothesized transference relationship between hypnotist and subject. Whitman, Pierce, Mass, and Baldrige's (1962) study showing that two thirds of the dreams of 10 subjects over a 40 night period dealt with the experimental situation might be similarly taken as supportive of the transference hypothesis. The hypnagogic effect of sustained monotony, Kubie and Margolin's state of partial sleep and reduced sensory-motor input, noted by such researchers as Sidis (1908 and 1909), Pavlov (1941), Lovell and Morgan (1942), Kleitman (1939), and Jacobson (1938), is also taken as supportive evidence.

White's Theory of Goal-Directed Striving

White (1959) viewed hypnosis as goal-directed striving which took place in an altered psychologic state of the individual. The

concept of goal-directed striving was not original with White, having been proposed earlier by Rosenow (1928), Lundholm (1928), Pattie (1935, 1937), and Dorcus (1937). White defined hypnotic behavior as "meaningful, goal-directed striving, its most general goal being to behave like a hypnotized person as this is continuously defined by the operator and understood by the subject." The individual was seen as making an active, discriminating, and motivated effort to behave according to his understanding of the hypnotist's expectations. He assumed that the hypnotic subject was usually aware of the hypnotist's true hopes and intentions. Therefore, if a hypnotized subject displayed only token resistance on being instructed to resist a hypnotic suggestion, White would attribute this to the subject's dominant motivation to behave like a hypnotized person rather than to deception. In order to explain those situations in which the subject's goal-directed strivings to behave as if hypnotized transcended the usual limits of volitional control, it was necessary to conceive of hypnosis as an altered state of consciousness. This altered state of the person made it possible to explain the peculiar character and surprising success of the subject's hypnotic striving.

Hypnotic induction was viewed as characterized by a state of drowsiness brought on by relaxation and a reduction of sensory input. The hypnotist was necessary for the purpose of administering suggestions and preventing the subject from passing through light drowsiness into real sleep. The disinhibitory effect produced by the condition of drowsiness was seen as opening up the range of actions accessible to the subject's hypnotic striving.

White presented very little in the way of research supportive of his position. He cited the work of Schilder and Kauders (1927) reporting the positive contribution of sedative drugs when other methods of hypnotizing failed as being consistent with his underscoring of the importance of drowsiness in producing the hypnotic state. In support of his conception that hypnosis is at one and the same time a goal-directed striving and an altered state of the person, White reinterpreted the findings of other investigators. Young (1941) divided opinions regarding the nature of the hypnotic state into two categories: (a) those adhering to a volitional hypothesis, and (b) those favoring the notion that profound organic changes result from hypnotic suggestion and who argue for an important alteration in the behavior mechanism. Young decided, on the basis of the evidence reviewed, in favor of the latter opinion. In an earlier article, Young (1926) had established that hypnotic phenomena such as catalepsy, posthypnotic amnesia, and exclusive rapport of the subject with the operator were the result of suggestion and do not necessarily appear if the suggestions are not made. Hull (1933) discarded the lowering of sensory thresholds as a distinguishing characteristic of the hypnotic state by showing that although ss may believe themselves to possess heightened sensitivities, actual measurement showed no difference from normal levels. That the hypnotic state differed from normal sleep was demonstrated by Bass (1931) who found that the knee jerk and voluntary key pressing to a bell stimulus remained unchanged during a deep hypnotic trance but disappeared in true sleep.

While the studies cited above tended to strip the hypnotic state of some of its former distinguishing characteristics, hypnosis research still indicated some transcendence of voluntary capacity in hypnotized subjects. Studies by Sears (1932), Dynes (1932), and Levine (1930), for example, clearly showed some reduction in reaction to sensory stimulation with hypnotic anesthesia when compared to the "normal" state. Some of the various normal reactions to a pin prick that were measured by Sears (1932) showed more of a change under hypnosis than others. Responses such as facial flinch and verbal report of pain were almost completely eliminated while the characteristic rise in pulse rate was reduced only 77 per cent, variability of pulse only 50 per cent, and psychogalvanic reaction only 22 per cent. In other words, the effect of hypnotic suggestion is smaller the further away from a volitional function one gets. Studies such as these convinced White that his theory of hypnosis must combine both the hypotheses delineated above by Young (1941). His conception of hypnosis as an altered state of the individual which is characterized by a change in the success achieved by certain kinds of striving was the result of this combination.

Shor's Concept of Reality-Orientation

Shor's (1959) theory of hypnosis reflected an expansion of White's (1941) concept of an altered state of consciousness. Shor proposed the concept of a generalized reality-orientation to refer to the usual state of consciousness in which a structured frame of reference supports, interprets, and gives meaning to all experiences. The

individual maintains this generalized reality-orientation through active, though unconscious, effort. Factors such as fatigue and monotony can cause the generalized reality-orientation to fade into the background of attention and become relatively non-functional. The special cognitive requirements of each immediate situation confronting the individual determined what emerged into the central background of attention. A trance state, in contrast to the normal waking state, resulted when close communication between various aspects of the generalized reality-orientation was lost and it faded into relatively nonfunctional unawareness. This situation occurs when the individual becomes so absorbed in one segment of reality that he becomes oblivious to and loses contact with everything else. The fundamental core of hypnosis thus consists of the focusing of attention on a small range of preoccupations resulting ultimately in the relative fading of the generalized reality-orientation into nonfunctional unawareness. With the fading of the generalized reality-orientation, a special orientation to instructions from the hypnotist results which may function as the only possible reality in view of the individual's relative isolation from the totality of general experience. A good hypnotic subject is defined by Shor as an individual with the ability to voluntarily relinquish his usual reality-orientation to assume a new and special orientation in which the only possible reality for him comes primarily from the hypnotist's instructions. Hypnosis is thus defined as a "special form of trance" which is achieved through motivated role-taking and is characterized by the establishment of a new and special state of reality-orientation.

Shor supports his contention of a diminished reality-orientation when one becomes absorbed in a particular stimulus with research showing this to occur with regard to focal attention (Schachtel, 1954), mystic experiences (Huxley, 1945 and 1956; James, 1936), and inspirational phases of creativity (Ghiselin, 1952; Hutchinson, 1949). Goldstein's (1939) work with brain-injured subjects provided Shor with the concept of certain behaviors functioning in "isolation" from the totality of generalized experiences as one's attention is focused on a circumscribed aspect of reality. The "isolated" behaviors take place in the trance state.

Role-Taking Theory

White's theory of goal-directed striving was narrowed down somewhat by Sarbin (1950) and Sarbin and Anderson (1967). Sarbin (1950) defined hypnosis as "one form of a more generalized kind of social psychological behavior, namely, role-taking." Role-taking perception and aptitude for role-taking were added to the motivational factors cited by White as important variables in hypnosis. They agree with White that the hypnotic subject strives to take the role of a hypnotized person but they insist that his success or failure depends on his motivation, role-perception, and role-taking aptitude alone. The concept of an altered state of consciousness was dispensed with as unnecessary. Role-taking in hypnosis was likened to role taking in dramatic acting. The actor cannot play a role convincingly if he is poorly motivated due to an incongruency between his self-concept and his perception of the role. Neither is a person motivated to take the

hypnotized role if his self-concept and his perception of this role are at odds. Assuming motivation to be favorable, both the actor and the hypnotic subject play their respective roles in accordance with whatever knowledge of that role they bring into the situation. Most people, through motion pictures, novels and the like, might be expected to have some idea how a hypnotized subject behaves. Finally, as the best actors are those who can absorb themselves completely in their role, so it is also with good hypnotic subjects. This hypnotic role-taking aptitude involves the organism as a whole and depends on the subject's ability to participate in "as-if" behavior. The hypnotic subject must be able to behave "as-if" he is deaf or blind or whatever role is suggested by the hypnotist. This role-taking aptitude or ability to use "as-if" formulations is considered to be quite similar to fantasy or imaginative behavior. The "as-if" formulation made it possible to discard the altered state of consciousness as an explanatory concept for physiological changes which can occur in hypnosis. The more ability the subject has to vividly imagine himself in the suggested situation, the better able he is to behave "as-if" he is actually in that situation.

As support for his theory of hypnosis as role-taking, Sarbin cited the theory of Magda Arnold (1946) that hypnotic effects were due to imagination. On the basis of experiments in which the vividness of subject's imaginal processes was correlated with behavior in a body-sway test, Arnold concluded that hypnosis consists essentially in concentrating and intensifying the subject's imaginative processes.

Sarbin and Lim (1963) found independent measures of hypnotizability and role-taking ability to be significantly related. Although some subjects were found who rated low on role-taking ability and high on hypnotizability, the converse was never true. All subjects rated high in role-taking ability were also high in hypnotizability. Coe and Sarbin (1966) investigated the efficacy of using the variables of (a) congruence of self and role, (b) role expectation, and (c) role-taking aptitude as predictors of hypnotic responsiveness. Subjects scoring high on role expectation and role-taking aptitude were found to show more hypnotic responsiveness than subjects with low scores on those variables. No such relationship was, however, found for the variables of congruence of self and role. Coe (1966) was able to show that role demand characteristics are important in determining hypnotic behavior and also that role-taking aptitude is an important factor in hypnotic susceptibility. Lewis and Sarbin (1943) told hypnotic subjects to imagine they were eating a meal when they were having gastric stomach contractions. A high correlation was found between depth of hypnosis and ability to inhibit hunger contractions. This finding was interpreted as showing that those subjects who were most successful in taking the role of the eater (i.e., those who could best imagine this role) were best able to initiate the internal responses necessary for cessation of the gastric contractions. Along these same lines, Sarbin and Madow (1942) had found a correlation between depth of hypnosis and the Rorschach W/D ratio, where the W or Whole response is considered as indicative of an active imagination.

Hypnosis as Conditioning

Salter (1955) conceptualized hypnosis as being based on associative reflexes for which words are the triggers of automatic, conditioned reactions. Hypnosis, then, amounts simply to the production of reactions in the individual through utilization of verbal or other associative reflexes. All persons possess verbally conditioned "bells" waiting to be rung. Hypnotic "suggestions" of ice and snow find trained neural patterns ready to receive them and to elicit shivering responses. Some individuals possess the appropriate conditionings which can be evoked to create a "trance state." Hypnosis, however, is not the production of a trance state but, rather, the eliciting of one. People who cannot be hypnotized do not possess the appropriate conditioning background. The "hypnotized" subject is seen as a "pure automaton," eliciting conditioned reflexes in a completely non-volitional manner to the verbal "bells" provided by the hypnotist.

Salter found support for his views in a number of research studies. Hudgins (1933), for example, found that the pupillary reflex could be brought under voluntary, albeit unconscious, control. The word "contract," spoken by the experimenter succeeded in eliciting a contraction of the pupil. When subjects were asked what they did in response to the word "contract," they replied "nothing." Hallucinatory behavior in hypnosis can also be explained by conditioning theory. Ellson (1941) followed a light stimulus with a 1000 cycle tone having a gradual onset and decline. After 60 presentations of the light-sound pairings, subjects reported hearing the sound when the light was

presented alone. These subjects were rendered incapable of discriminating between an actual sound and their own hallucinations. Perky (1910) and Miller (1939) produced visual hallucinations by similar techniques. Further evidence that the stimuli producing conditioned responses could originate within the subject was provided by Menzies (1941). After a number of trials which paired a light stimulus with emersion of the right hand in cold water, Menzies was able to record a temperature drop in the left hand following presentation of the light stimulus. Loomis, Harvey, and Hobart (1936) were able to control brain wave patterns by alternately talking to subjects about seeing and blindness. Shagass (1942) was able to show that the human occipital alpha rhythm could be conditioned to the voluntary act of clenching the fist.

The theory of hypnosis as being nothing but an aspect of conditioning would suggest the possibility of training involuntary antisocial behavior into a moral, law-abiding subject. The research studies of Rowland (1939), Wells (1941), and Brenman (1942) showed that, with appropriate procedures, hypnotized persons not only will perform antisocial acts but may even go so far as to criminally harm themselves or others. The generalized hypersuggestibility characteristic of trance behavior is due, according to Welch (1947), to abstract conditioning. The induction procedure itself consists of giving conditioned verbal stimuli which are then followed by the act symbolized by the words. For example, a subject fixing his gaze on a given object may be told that his eyes are becoming tired and they do

become tired. Then the subject is told that his rate of eye blinking will increase and it does so. After a period of sufficient repetition of this process abstract conditioning occurs and the subject will give the appropriate action to a symbolic stimulus that has never been reinforced. An investigation by Corn-Becker, Welch, and Fisichelli (1949) established the existence of abstract conditioning. A series of words such as "red" and "music" were flashed on a screen and followed by the actual event which they represented (i.e., red light to word "red," music to word "music," etc.). The words "electric shock" appeared several times in this random word series but were never reinforced by the actual event. Seventy-three per cent of the subjects gave psychogalvanic responses to the words "electric shock" which were either greater or of longer duration than responses to any of the reinforced words.

Hypnosis as a State of Heightened Suggestibility

Hull (1933) defined hypnosis as a state of generalized hyper-suggestibility in which the increase in suggestibility takes place as the trance is entered. The trance state differs only quantitatively rather than qualitatively from the normal waking state of the individual. Any behavior of the individual in the hypnotic state can be produced also in the waking state although perhaps to a lesser degree. The induction of a hypnotic state is viewed as a process of habituation.

Hull's theory of hypnosis represents to some extent, an updated

version of the ideomotor theory of action described by James (1890). The principle of ideomotor action states that every representation (or idea) of a movement stimulates to some extent the actual movement which is its object and awakens it to a maximum degree if a simultaneously present antagonistic representation does not prevent it from doing so. Stated in another manner, the unhesitating and resistless completion of an act requires the complete absence in the mind of any conflicting notion.

Hull proposed two levels of habitual reactions, a symbolic level and an instrumental level. The essential mechanism which mediates the hypnotic behavior (instrumental act) of the subject is the speech (symbolic act) of the hypnotist. In the induction procedure, suggestions are given the subject to relax and think of nothing but sleep. These instructions are viewed as facilitating the subject's state of mind such that his own symbolic processes remain passive with regard to particular acts suggested. Proprioceptive stimuli arise in subjects as a result of the hypnotist's symbolic acts (speech) and these stimuli are assumed, due to prior conditioning, to have the capacity of eliciting the appropriate reaction. Thus, the continuous stimulation of the passive subject by the words of the hypnotist associated with a particular act will eventually bring about the act.

The apparent transcendence of voluntary control reflected in some hypnotic behavior is viewed by Hull as being attributable to conditioning phenomena. In his opinion, "all reactions susceptible to control by suggestion are ultimately capable of being controlled

voluntarily by suitable conditioning to or association with proprioceptive stimuli arising from one's own symbolic activities."

Research by Edmonston (1967) and Kreuger (in Hull, 1933) has shown that hypnosis does indeed obey the characteristics of habit phenomena. Weitzenhoffer and Sjöberg (1961) reported evidence that the formal induction of hypnosis has an enhancing effect on the suggestibility of some individuals. Edmonston and Robertson (1967) and Barber and Glass (1962) reported similar findings, although Barber and Calverley (1962, 1963a) later demonstrated an equated effectiveness for hypnotic induction and task-motivating instructions without hypnosis.

Barber's "Empirically-Based" Formulations

Barber (1964a, 1969, 1970) argues that the concepts of "hypnosis" and "hypnotic state" are impossible to verify empirically and, since their existence cannot be demonstrated, they should be discarded. All so-called "hypnotic" behaviors are conceived by Barber as being functionally related to denotable antecedent variables similar to those controlling behavior in a variety of interpersonal situations. Antecedent variables which were felt to determine behavior in the "hypnotic" situation include the attitude, expectancy, and motivation of the subject with regard to the situation and the "hypnotist's" wording and tone in giving suggestions or in inquiring as to the subjective experiences of the individual. Consequent variables specified by Barber included responses to test-suggestions to perform in a certain manner,

the subject's reports of having been hypnotized, and hypnotic appearance.

Barber's attack on the concept of hypnosis progressively narrowed it into non-existence. He reported, in an initial study (1958), that "good" hypnotic subjects continued to "perceive" an object suggested by the "hypnotist" to be no longer present so long as the "hypnotist" continued to behave as if the object were indeed still present in the room. In a later study (1960), he reported that some subjects with unfavorable attitudes, motivations, and expectations toward hypnosis showed many hypnotic behaviors while other subjects who were favorably inclined toward hypnosis remained impervious to repeated attempts by many hypnotists. He concluded that the "good" hypnotic subjects were those who could be selectively attentive to the hypnotist. Barber and Deeley (1961) then found that normal persons with instructions to concentrate away from red and green gave as many "color blind" responses as "deeply hypnotized" subjects who received elaborate color blindness suggestions. In an article reviewing hypnotic age regression (1961a), Barber underscored the fact that it remained undemonstrated that early patterns of behavior performed by "age-regressed" subjects could not be voluntarily performed by appropriately motivated un hypnotized subjects. Barber and Calverley (1963b) showed that subjects receiving both task motivating instructions and hypnotic induction were more responsive than subjects receiving only one or the other or neither of these conditions. They followed this work with the discovery (1964) that telling subjects they were in a

"hypnosis group" and that responding to suggestions was easy made them more suggestible than subjects told the opposite. Barber (1966) next reported the finding that "hypnosis" alone, without suggestions for enhanced performance had no effect on strength or endurance while motivating instructions similarly augmented the performance of both "hypnotized" subjects and those in the normal waking state. Barber and Calverley (1966) found no support for Hull's postulate that hypnotic susceptibility is a habit phenomenon which is facilitated by practice. They interpreted subject variability in degree of hypnotic susceptibility to be due to variations in interest, attitudes and expectations regarding hypnosis. Barber and Calverley (1968) again reported (as in 1963b) that subjects receiving the hypnotic procedure along with motivational instructions showed an increase in suggestibility above those subjects receiving motivational instructions alone. This time, however, they attributed the greater enhancement of the combined motivational-hypnosis condition to the higher effectiveness of the hypnotic induction procedure in defining the situation as one in which unusual manifestations were within the subject's capabilities and also expected by the experimenter.

Status of the Trance State Concept

The various ideas presented above offer a brief look at some of the major and representative theories of hypnosis. Sutcliffe (1960, 1961) separated theoretical formulations of hypnosis into two groups which he labeled the "credulous" and "skeptical" views of hypnotic phenomena. The "credulous" group was distinguished by its assumption

that the perceptions arising from hypnotic suggestions are identical in sensory content to perceptions arising from objects in the real world. Proponents of the "credulous" view tend to take the subject's report of his subjective hypnotic experiences at face value. If, for example, a hypnotic subject is told he is drinking coffee and he proceeds to describe the aroma and flavor, the "credulous" view would be that he does in fact "smell" and "taste" the coffee. "Credulous" theorizers view the trance condition as being qualitatively different from the normal waking state of the individual. The hypnotized individual is felt to be in an altered state of consciousness. Another way of categorizing such formulations would therefore be to label them as "state" theories of hypnosis.

Proponents of the "skeptical" or "non-state" view would tend to doubt the subject's testimony in the example given above. They would contend that the subject would perceive the situation as it actually was (i.e., no coffee present) but would behave as if it were as the hypnotist suggested. As stated by Sutcliffe (1961), "they allow that there may be differences of subjective experience in trance and non-trance states, but doubt that hypnotic fantasies have the same sensory content as parallel perceptions of real stimuli." Their skepticism is based on the lack of unequivocal criteria for distinguishing hypnotic behavior from simulation.

Of the theories covered in this paper, those of Kubie and Margolin (1944), Gill and Brenman (1961), White (1941), and Shor (1959) are representative of the "credulous" or "state" view. The formulations

of Sarbin (1950), Salter (1955), and Barber (1964a, 1969, 1970) are consistent with the "skeptical" or "non-state" view, while Hull's theory, proposing only a quantitative rather than a qualitative difference between the trance and waking states, falls somewhere between the two major categories.

Evidence regarding the "state" versus "non-state" controversy:
Physiological indices

Levine (1930) used the psychogalvanic skin response as a physiological indicator along with the subject's verbal report of pain in an investigation of hypnotic anesthesia. Whereas hypnotized subjects reported no pain in response to a pin prick, their physiological reaction as measured by the GSR was identical to that of waking subjects with hysterical anesthetics of the forearm. Dynes (1932) added measures of respiration and heart rate to the GSR in a study of hypnotic anesthesia. These measures were identical for subjects in the waking and hypnotized states except for a slower rate of respiration in the hypnosis state. Dynes also reported no significant difference in GSR response to a pistol shot for the waking or hypnotically "deaf" states. Sears (1932) found hypnotic anesthesia to produce a marked reduction in facial flinch and verbal report of pain as opposed to responses in the waking state. No significant differences were reported between the waking and hypnotized states for measures of reflex leg withdrawal, respiration, pulse, and GSR.

Pattie (1937), in a study of anesthesia to touch, was unable to show that hypnotically anesthetized subjects differed in touch

sensation from waking controls. Brown and Vogel (1938) found that hypnotic anesthesia was not as successful as chemical anesthesia in reducing physiological reactions to pain. They also reported that waking simulation was as effective as hypnotic anesthesia in reducing more voluntary reactions to pain.

Lundholm and Lowenbach (1942) reported that the alpha rhythm of the EEG disappeared with noise regardless of whether or not the subject was in a waking or hypnotically deaf state. The alpha rhythm was unresponsive to positively hallucinated visions. That is, the alpha rhythm responded to the real state of affairs rather than to the suggested or "hallucinated" state.

West (1952) used the GSR measure in comparing the waking reactions of subjects to pain with their reactions under hypnotic anesthesia. For individual subjects, he found a reduction from 26 to 67 per cent in GSR response. Sutcliffe (1961) found no absence of GSR to electric shock for hypnotically anesthetized subjects as compared to waking controls. Although they reacted physiologically to the electric shock, the hypnotically anesthetized subjects reported they could feel no pain.

London and Fuhrer (1961) and Rosenhan and London (1963a, 1963b) reported that the waking base levels of muscular strength, endurance, coordination and verbal learning were higher for subjects who were relatively insusceptible to hypnosis as compared to highly susceptible subjects. Any changes in these measures under hypnosis were reported as being as great with the insusceptible as with the

highly susceptible subjects. Evans and Orne (1965) were unable to replicate these results.

Barber (1961b) concluded that whatever changes could be produced via hypnosis in sensory, circulatory, gastro-intestinal, and cutaneous functions, similar effects could be produced by "symbolic stimulation" in the waking state. Barber and Hahn (1963) tested heart rate, respiration, skin resistance and forehead muscle tension in a group of subjects who were paid to cooperate in what was presented as a "physiological study." They found that relaxation and hypersuggestibility in these subjects could be as easily produced by waking suggestion as by hypnotic induction techniques.

Damaser, Shor, and Orne (1963) found no differences in a variety of physiological measures whether emotionally charged situations were suggested to hypnotic subjects, subjects in the waking state or subjects simulating hypnosis.

Beck and Barolin (1965) used subjects of demonstrated hypnotic susceptibility and found that no changes measurable by evoked potentials from the visual cortex occurred in response to suggested visual stimuli, although subjects reported "seeing" the stimuli.

Words of encouragement and analgesic instructions were found by Slotnick and London (1965) to facilitate performance in the hypnotic but not in the waking state. Within the hypnotic state, analgesic instructions were less effective than words of encouragement.

Reid and Curtsinger (1968) reported that, with subjects in light to moderate trance, they recorded an average increase of 0.6

degrees Fahrenheit in oral temperature which subsided when trance was terminated. Oral temperature measurements of control subjects receiving relaxation instructions without hypnosis showed no significant increase. Timney and Barber (1969) confirmed Reid and Curtsingers' results. They measured oral temperature in 19 subjects under hypnotic and control conditions. Of the 19 subjects under hypnosis conditions, 6 showed no change and 3 actually dropped in oral temperature. The significant rise in oral temperature was due to increased measurements in only 10 out of the 19 subjects. Temperature change was found to be unrelated to suggestions or to subject's testimony that they were or were not hypnotized. Both "good" and "poor" hypnotic subjects showed the same degree of temperature rise, but those subjects who had the least previous experience with hypnosis tended to show the greatest temperature increase.

The studies reviewed above comprise a representative sampling of research in the area of hypnosis. The earlier research tended in some ways to favor the "state" position with regard to hypnotic phenomena. However, these early data may be characterized at best as somewhat equivocal. The most consistent changes were recorded in those physiological reactions that are subject to voluntary control while autonomic functions were found to be virtually unaffected. These same physiological reactions were, in most instances, as effectively altered in the waking state as in the hypnotized state. Most researchers found that even if physiological reactions were identical in the waking and hypnotized states, verbal reports indicated that

hypnotized subjects had accepted the suggestions they were given. While the earlier studies were characterized by inadequate controls, some attention to this important variable is apparent in the more recent literature. In general, the bulk of the data reported here would appear to favor the "non-state" view of hypnotic behavior.

Evidence regarding the "state" versus "non-state" controversy:
Behavioral indices

Lundholm (1928) was unsuccessful in conditioning finger withdrawal to an auditory stimulus for which deafness had been suggested in the hypnotic trance. When deafness was suggested in trance for an auditory stimulus to which subjects had been previously conditioned, they ceased to respond to further CS presentations. It was noted that subjects' conditioned responses appeared more like voluntary inhibitions than like normal conditioned responses.

Erickson hypnotically produced "unconsciousness" (1937), "deafness" (1938a, 1938b, 1944), "color blindness" (Erickson and Erickson, 1938, 1939), and "after-images" (Erickson and Erickson, 1938) and was quite explicit in insisting that they were identical to the naturally occurring organic conditions they represented. Erickson applied "a number of clinical tests of deafness" in his initial study and concluded that the suggested condition was indistinguishable from neurological deafness. He then replicated Lundholm's results by showing that a response previously conditioned to an auditory stimulus disappears when deafness for the auditory stimulus is suggested under hypnosis. When "deafness" was removed by suggestion, the conditioned

response reappeared. Waking subjects were unable to inhibit the conditioned response. In the "after-image" research, subjects were hypnotized and shown blank cards which the experimenter described as brightly colored. The experimenter named the first "color," subject the second, experimenter the third, and so on. The hypothesis was that subjects would give the appropriate after-image for the "colors" identified by the experimenter. Erickson felt the results supported the hypothesis because the perceptual process resulting from the fantasy "after-image" was identical to that produced by the real stimulus.

Hibler (1940) disagreed with Erickson and concluded that "there is no evidence that hallucinations produce any cerebral or sensory changes in the organism which cannot be explained in terms of mere verbal agreement, and cooperation with the experimenter" (p. 56). Grether (1940) challenged Erickson's (1939) findings with regard to "color blindness." Grether asserted that Erickson's concept of color blindness was mistaken and that, consequently, the hypnotically induced conditions of Erickson's study differed from color vision anomalies of the sort that occur naturally.

Young (1940) attempted to hypnotically regress one group of subjects to 3 years of age while a second group was asked to simulate an age of 3 years in the waking state. Neither group was able to produce the actual performance of 3 year olds as determined by pre and post mental age measurements.

Pattie (1950) attempted to induce unilateral hypnotic "deafness"

in 12 subjects. Four subjects in the trance state reported an inability to hear a tone presented to the "deaf" ear. When, however, two tones of slightly different frequencies were presented simultaneously, one to each ear, these 4 subjects reported hearing beats. Since a person organically deaf in one ear would perceive a single tone in this situation, as opposed to the bilaterally intact individual's perception of beats, it was concluded that these "deaf" subjects could hear normally.

Orne (1951) reported results similar to Young's in an age regression study. Neither subjects hypnotically regressed to age 6 nor waking simulators produced Rorschach protocols, handwriting or drawings identical to the norms for 6 year olds.

Rosenthal and Mele (1952) studied visual hallucinations in a design generally similar to that used by Erickson and Erickson (1938) and reported positive results with subjects in a deep hypnotic trance.

Kline (1954) found that although the performance of hypnotically "deaf" subjects under a condition of speech feedback distraction was not significantly different from waking performance, there was evidence of more resistance to feedback distraction in the trance state.

Cooper and Erickson (1954) conducted a number of studies of hypnotic time distortion. In one study, a hypnotized subject was told to "hallucinate" a scene on a farm where she was to count the strokes of a butter churn for a suggested period of 10 minutes. Although the subject was awakened only 10 seconds after beginning to "hallucinate,"

she reported counting 114 strokes. No controls for waking performance were included in the study. In a variation of this technique, it was suggested to another hypnotized subject that she was conducting a 10 minute interview with a married couple. Although the subject was awakened only 10 seconds after the suggestion was initiated, she gave an elaborate and detailed account of the interview. Again, no waking controls were used.

Das (1958, 1959, 1961) in a series of articles attempted to confirm the Pavlovian theory of hypnosis as a state intermediate between wakefulness and sleep..... In one study, Das exposed subjects to alternating monotonous sound and light stimuli resulting in a state of inhibition (drowsiness). The development of this state of inhibition appeared to improve with practice and to correlate positively with increasing hypnotizability. In a later study, Das compared the ability of "good" hypnotic subjects to learn paired associates in the waking state with recall in hypnosis and their ability to learn similar material in hypnosis with recall in the waking state. His results indicated that recall under hypnosis was the poorest while learning under hypnosis was equivalent to learning in the waking state. He took these results as confirmation of the theory that hypnosis is a state of cortical inhibition since work with animals had shown that sedation weakens retention but has no effect on learning. Das defined hypnosis as a learned state of partial cortical inhibition which he expressed as a multiplicative function of learning and inhibition: $H = f(L \times I)$, where H = hypnosis, L = learning, and I = partial cortical inhibition.

Rosenberg (1959) gave a group of hypnotic subjects a post-hypnotic suggestion reversing their affective response on an attitude issue of high interest to each. A group of waking controls was asked to simulate "affect reversal." Rosenberg took his finding of no significant difference between groups as disconfirming the description of hypnosis as a dissociative state (i.e., a "state" in which the personality "splits," with the part remaining under the subject's control being, in most cases, dominated by the part controlled by the hypnotist).

Orne (1959) tested and confirmed the hypothesis that subjects' "knowledge" regarding behavior in hypnosis influenced their own hypnotic behavior. Orne also showed that motivated waking performance was capable of surpassing hypnotic performance with respect to physical endurance. Hypnosis and the waking state were, however, found to differ with regard to subjective experience. Subjects in a deep trance described the state as discontinuous from their normal waking experience, described feeling unable to resist cues given by the hypnotist, and appeared better able than simulators to accept as subjectively real suggested alterations in their environment that did not conform to reality.

Barber (1959) had some subjects "hallucinate" a color and "see" its appropriate after-image after a minimal "hypnotic" induction procedure. Other subjects were simply asked to do the same thing without hypnotic induction. Not only was the performance of the two groups essentially the same, but some subjects did even better without hypnotic

induction. Barber interpreted these results as disconfirming the notion of "hypnotic transcendence of normal functions."

Edmonston (1961) reported support for the functional ablation ("state") theory of hypnotic behavior. Ablation theory hypothesized that hypnotic age-regression was attributable to the hypnotist's words functionally ablating both learned and maturational behaviors which appeared after the age to which a subject was regressed. Edmonston's hypnotically age-regressed subjects "re-acquired" a previously established conditioned-avoidance response in "almost precisely" the same manner.

Glass and Barber (1961) found that 20 out of 30 subjects tested for suggestibility scored higher following formal trance induction than they did when simply requested to imagine a particular situation. However, 12 of these 20 subjects, when given a "powerful hypnotic drug" placebo, showed an increase in suggestibility comparable to that following hypnotic induction. The authors concluded that a placebo was as effective an agent as formal trance induction in increasing suggestibility.

Barber and Glass (1962) found that direct suggestions without hypnotic trance induction were sufficient to produce behaviors usually associated with "hypnosis." Suggestions given alone were not, however, found to be as effective in eliciting "hypnotic behaviors" as suggestions given after formal trance induction. They attributed their results to subject variables rather than to hypnosis. Barber and Calverley (1963a) gave one group of subjects only explicit task-motivating instructions, another group only a standardized conventional

trance induction, and a third group task-motivating instructions plus trance induction. A fourth group received neither trance induction nor task-motivating instructions. Ratings of enhanced "suggestibility" under these 4 conditions showed hypnotic trance induction and task-motivating instructions to be virtually identical in effect. Using both procedures on the same subjects was not found to have an additive effect with regard either to "suggestibility" or to "hypnotic-like" behavior. Barber (1964b) next presented experimental data showing that hypnotized subjects who have received suggestions of color blindness, blindness, or deafness do in fact perceive visual and auditory stimuli. He further stated that both the overt performance and subjective reports that characterize these "states" of "hypnotic blindness," "hypnotic color blindness," and "hypnotic deafness" can also be elicited from unselected waking controls who are simply given instructions to try to ignore specified colors or visual or auditory stimuli. Efforts made to motivate waking subjects and hypnotized subjects to make an effort to perform well on experimental tasks resulted in little noticeable difference in overt or subjective responses to "primary" suggestions. These "primary" suggestions included limb rigidity, visual and auditory hallucinations, amnesia, "posthypnotic" responses, time distortion, and analgesia to noxious stimulation. Hilgard (1965) was able to show small, statistically significant differences in comparing hypnotic induction instructions and motivating instructions in favor of the former. His results suggested that group comparisons lacked sufficient sensitivity to small, but real, differences between instructional conditions. Hilgard and Tart (1966)

confirmed this finding by experiments using both the group comparisons of Barber and Calverley (1962, 1963a) and individual comparisons. They concluded that their research was supportive of Hull's theory since the data showed that hypnotic induction yielded a small, but significant hyperfacilitation of responsiveness to suggestions.

Bowers (1966) gave a group of hypnotized subjects a posthypnotic suggestion to begin sentences in a post-state interview with "he" or "they" and to be amnesic with regard to this behavior. Identical suggestions were given to a group of waking simulators preceded by instructions to behave later as if they had been hypnotized when the suggestions were given. In a postexperimental interview with a different experimenter, 8 out of 14 hypnotic subjects were amnesic for their experimental behavior while none of the 13 simulators were amnesic. Further, all simulating subjects testified that their use of "he" and "they" had been voluntary while 12 of the 14 hypnotized subjects testified the reverse. Bowers concluded that hypnotic behavior cannot be wholly reduced to acting in accordance with demand characteristics. There is a "state" of hypnosis within which suggestions have a potent effect. Bowers (1967) next presented some data intended to cast doubt on the testimony of waking simulator subjects unselected for hypnotic susceptibility. He first told a group of unselected subjects to hallucinate (a cat on their lap and music), then had them rate the reality of their hallucinations. Next, all subjects were task-motivated (e.g., "everybody before you who has tried this has been able to do it") to hallucinate. Before retest reality ratings were solicited, half of

these subjects were confronted by a second experimenter with demands for report honesty. The other half of the subjects made their retest reality ratings with no additional instructions, in the same room in which they had "hallucinated," and with the same experimenter present. The mean test to retest rating changes for both the visual and auditory hallucinations were significantly greater for the task-motivated than for the honesty-report condition. The results were interpreted as indicating that ratings of reality of hallucinations are highly susceptible to the context of demands in which the report is made.

Fehr and Stern (1967) described a situation in which subjects, while performing a vigilance task, were periodically presented with extraneous stimuli. Hypnotized subjects as compared to waking controls demonstrated less responsiveness to the extraneous stimulation both physiologically and behaviorally.

Erickson (1967) reviewed his own experimental work over the years along with that of other investigators and stated his feeling that a somnambulistic hypnotic subject spontaneously perceives the surrounding environment of realities differently than does a subject in the ordinary state of waking consciousness.

Edmonston and Marks (1967) found that hypnosis and task-motivating instructions not only failed to enhance kinesthetic learning, as measured by a 10-choice-point stylus maze, but tended to have an opposite effect.

Barber, Dalal, and Calverley (1968) presented two experiments which demonstrated: (a) that subjective reports of hypnotic subjects

are affected by slight variations in the wording of questions submitted to them, and (b) that statements made by the experimenter, after termination of the trance, influenced subjects' reports of what they had experienced during the session. The authors concluded on the basis of their data that subjective reports of hypnotic subjects should not be regarded as satisfactory indices of their actual experiences or as indices of the "hypnotic state." Barber and Calverley (1969) next placed subjects who had never participated in hypnosis research in a situation where they were told simply to close their eyes for 5 minutes and place themselves in hypnosis. On 4 dimensions of "hypnotic behavior," namely, trance-like appearance (apparent limpness or relaxation), responses to suggestions to hallucinate or be amnesic, reports of unusual experiences (e.g., reported "disappearances" of body parts), and testimony of having been hypnotized, these subjects were almost as responsive as subjects exposed to a formal induction procedure. A group of control subjects who were told simply to close their eyes for 5 minutes were less responsive than the place-yourself-in-hypnosis subjects and the trance induction subjects.

The chronological ordering of the above experiments results in a somewhat confusing array of data considering that they could have been placed in "evidence-for" and "evidence-against" categories. It was, however, felt that a chronological presentation also allowed a "clearer" look at the evidence in the sense that, while any research endeavor should stand on its own merits, it must also be evaluated against the background of existing knowledge.

The studies reviewed above reflect that a great deal of research has been generated over the past 40 years in support of both the "state" and the "non-state" positions. Although in more recent years the bulk of the data, much of it provided by Barber and his associates, appears to be swinging more toward the "non-state" position, the "state" concept continues to have prominent adherents.

The studies reviewed present a variety of experimental designs, but perhaps the most important variable on which they differ is in the use (or misuse) of control groups. Although the importance of using control subjects in hypnosis research was first stated by Young (1926) in the mid-twenties, the degree of sophistication in control group utilization has progressed rather slowly. Young (1926) proposed that the only means by which hypnotic causation could be established was for hypnotic behavior to be compared to behavior in the "normal waking state." That the form of the waking control is important was shown by Pattie (1935). Using the same subject in both the trance and waking states raises the problem of transfer effects. A further complication suggested by Pattie was the possibility of the subject's bringing his trance and waking performances into accordance with the demands of the situation or with the relationship expected by the hypnotist.

Orne (1959) demonstrated the potency of the demand characteristics of the experimental procedure in determining subject responses in the study reviewed above. The subject's preconceptions regarding hypnosis have an effect on the outcome as may cues implicit in the experimental design. For example, if the subject can pick up any cues

from the experimenter as to desired outcome, he may try to help further "scientific knowledge" by compliance with these demands. Orne proposed the use of simulator subjects as controls in hypnosis experiments. The simulators were selected for their insusceptibility to hypnotic induction and were told, in effect, to "fake" hypnotic behavior. They were exposed to the same experimental procedures as the hypnotic subjects with the experimenter being "blind" as to which of the groups a subject belonged. Distinguishable differences between simulator behavior and hypnotic behavior could thus be attributed to the hypnotic trance state.

Later research, however, tends to cast some doubts on the homogeneity of simulator performance (Overly and Levitt, 1968). Simulator subjects are usually assumed to simulate unanimously and successfully any voluntary behavior. Overly and Levitt found this not to be the case. The performance of 2 simulator groups on a variety of voluntary behaviors was significantly more variable than that of susceptible subjects.

Barber (1962) was critical of using simulator controls as proposed by Orne. The performance of simulator and susceptible subjects could not be appropriately compared due to possible pre-existing differences between such subjects on variables such as expectation, suggestibility, motivation, etc. Orne's simulator and susceptible subjects also received different treatment, the susceptible group usually taking part in preliminary training sessions not given the simulators. A final point was made regarding the instructions given the two groups.

Although the instructions would appear identical, implicit in the simulator group's instructions was the implication that they were to "fake" rather than experience the "hypnotic" suggestions. Susceptible subjects, on the other hand, expected to experience the suggestions. Barber felt that a better experimental design would involve the use of independent groups with subjects either selected or unselected on the basis of susceptibility and randomly assigned.

Schneck (1969) maintained that Barber's "waking controls" were capable of "voluntarily" producing "hypnotic" behavior because they were in fact hypnotized. This view was shared by Tart and Hilgard (1966) who felt that neither Orne's simulator control nor Barber's waking control designs took into account the possibility of subjects spontaneously "slipping into hypnosis." They found that a group of subjects, who were highly responsive to suggestions in both the "waking state" and following induction procedures, had actually responded favorably in the "waking state" because of spontaneously entering a hypnotic trance. Some method such as a self-report scale was suggested as a means of controlling for those subjects who spontaneously enter hypnosis or who do not enter hypnosis despite an induction procedure. Tart and Hilgard advocated a design whereby each subject served as his own control with treatments counter-balanced.

Variables Related to Hypnotic Behavior

Subject Variables

London (1961) found no gross differences between boys and girls with regard to their interests, experiences, or attitudes toward

hypnosis. A later survey (1962) failed to uncover any gross differences between volunteers and non-volunteers with regard to interests in or experience with hypnosis. No particular personality traits (as measured by the MMPI, Cattell's 16 PF, and the California Personality Inventory) were found which could distinguish volunteers from non-volunteers. The finding that sex and hypnotic susceptibility are uncorrelated is consistent with other evidence (Weitzenhoffer and Weitzenhoffer, 1958; Hilgard and Bentler, 1963). Other researchers have similarly failed to find personality differences between volunteers and non-volunteers (Cooper and Pedersen, 1965) and susceptible and insusceptible subjects (Evans, 1963).

Boucher and Hilgard (1962) and Melei and Hilgard (1964), although reporting no sex differences, found that volunteers scored significantly higher on a hypnotic susceptibility scale than did non-volunteers. Rosenhan and Tomkins (1964) found a correlation between wanting to participate in a hypnosis experiment and hypnotizability for females, but not for males. No differences were found, on semantic differential responses for concepts related to hypnosis and research, between groups of volunteers, non-volunteers, highly susceptible, and un hypnotizable subjects (Zamansky and Brightbill, 1965). Edwards (1969) found no differences between female volunteers and non-volunteers on measures of intelligence and ego strength. Volunteers did, however, appear to perform less effectively on academic tasks.

A significant negative relationship between measures of self-awareness and hypnotizability was found by Vingoe (1967). Subjects who

tended to underestimate their extraversive characteristics were more hypnotizable than those who overestimated. Other research has shown no relationship to exist between social intelligence and hypnotic susceptibility (Hartman, 1967) or between the presence or absence of the expectation to be hypnotized and degree of suggestibility (Starr and Tobin, 1970).

Experimenter variables

That experimenter bias can be a potent factor in affecting experimental outcome has been shown by several studies (Rosenthal, 1968; Barber and Silver, 1968).

Troffer and Tart (1964) had 8 hypnotist-experimenters administer a standardized suggestibility test to subjects under 2 separate experimental conditions. Although these experimenters understood the problem of experimenter bias, knew that they were being checked, and felt that they had treated both groups alike, judges were able to tell whether subjects were under the condition of imagining the susceptibility scale items or the condition of responding to the items while hypnotized by listening to tape recordings of the experimenter's performance.

Another study (Hartman, 1967) sought to determine the effect of task-motivating instructions and experimenter attitude on hypnotic susceptibility. Subjects were randomly assigned to Group 1 (task-motivated - E neutral), Group 2 (non-task-motivated - E neutral), Group 3 (task-motivated - E friendly), Group 4 (task-motivated - E harsh), Group 5 (non-task-motivated - E friendly), and Group 6 (non-task-motivated - E harsh). Hypnotic susceptibility was not found to

be affected by task-motivating instructions. The variable dealing with experimenter attitude was, however, found to be highly significant.

Previous contact with the hypnotist has been shown to somehow affect the hypnotic susceptibility of subjects (Kramer, 1969). The standard hypnotic susceptibility scale was presented to two matched groups of subjects using a tape recorded induction procedure. One of the groups was unfamiliar with the hypnotist, while the other group knew him as their classroom instructor. The group which knew the hypnotist showed significantly higher susceptibility scores than did the unfamiliar group.

Situational variables

Studies reviewed above underlined the effects on hypnotic behavior effects of: the demand characteristics of the experimental procedure (Orne, 1959; Bowers, 1967), the presence or absence of task-motivation (Barber and Calverley, 1963; Barber, 1964), defining the situation as one involving hypnosis (Glass and Barber, 1961; Barber and Calverley, 1969), and variations in the way subjects are interviewed (Barber, Dalal, and Calverley, 1968).

Levitt and Zuckerman (1962) studied the effects of monetary incentives and additional knowledge regarding hypnosis on the performance of subjects in an hypnosis experiment. The data indicated that 4 out of 5 subjects volunteering for hypnosis research are motivated, at least initially, by factors other than financial remuneration (\$35). Further, hypnotic performance was found to be unaffected by a 10 minute lecture on hypnosis given prior to induction.

Posthypnotic Behavior

"Most important of all hypnotic phenomena is posthypnotic suggestion, whereby we are able to transfer all the conditions of the trance to the waking state." (LeCron and Bordeaux, 1949, p. 124). Posthypnotic behavior is, thus, behavior suggested to the subject in the trance state, but carried out after termination of the trance. Pattie (1956) described posthypnotic behavior as one of the most infallible indicators that a trance state was genuine. Barber (1962b), on the other hand, considered posthypnotic behavior to be simply the result of suggestion.

Fisher (1954) reported on a number of characteristics of posthypnotic phenomena. He saw the continued performance of a posthypnotic suggestion as being a function of the subject's belief that the hypnotist expected the behavior to occur. The eventual form of the posthypnotic behavior appears to be determined by the subject's inferences as to what the experimenter expects rather than appearing as concrete, literal manifestations of the suggestion. Further, a subject "tricked" into failing to carry out the posthypnotic suggestion by being led to believe the experiment was over tended either to deny his "negligence" or to rationalize it somehow.

Johnson, Massey, and Kramer (1960) trained male subjects in excellent physical condition to meet specified criteria of hypnotic trance depth, including complete posthypnotic amnesia. These subjects were tested twice on a physical endurance task (the bicycle ergometer). They were placed in a trance before both tests and, in addition, before

one test they were given the posthypnotic suggestion (not to be recalled consciously) that they would have unusual strength, endurance, and freedom from fatigue. Although performance following the posthypnotic suggestion was not found to be enhanced, the subjective reports were more favorable in this condition. Hilgard (1963) might have interpreted these results as being due to the subjects' resistance of the hypnotist. Hilgard found that 11 out of 12 moderately susceptible subjects instructed to resist suggestions given in hypnosis were able to resist most or all the selected items.

Wright (1966) reported, on the basis of work done by himself and other investigators (Hilgard, 1966; Kline, 1966; Orne, 1966), that the occurrence and characteristics of posthypnotic amnesia were greatly influenced by the relationship established between the subject and the hypnotist as well as by factors within the subject. Whereas usual forgetting is regarded as an intrapersonal process of passive "deactivation" or decay, posthypnotic amnesia is considered an active process participated in by both the subject and the experimenter. Hilgard and Cooper (1965) had, for example, reported that only 6 out of 91 subjects tested showed spontaneous posthypnotic amnesia and only 35 out of 91 subjects tested showed suggested posthypnotic amnesia. The criterion of amnesia used in the study was ability to recall only 4 or fewer of 10 items of a standard susceptibility scale presented earlier. A division of the subjects into high and low susceptibility groups led to the finding of a marked advantage for suggested amnesia over spontaneous amnesia for the highly susceptible subjects. Highly

susceptible subjects showed no more spontaneous amnesia than low susceptibility subjects. Hilgard and Cooper concluded that those experimenters who report a high frequency of spontaneous posthypnotic amnesia are probably giving their subjects unintentional cues that this is what they expect.

Significance of the Present Study

As reported above, the "state" versus "non-state" controversy still exists regarding hypnotic behavior. Research evidence for the position which attributes hypnotic behavior to an altered state of the individual exists throughout the literature (Lundholm, 1928; Erickson, 1937, 1938a, 1938b, 1939, 1944; Cooper and Erickson, 1954; Slotnick and London, 1965). The more recent literature is, however, heavily oriented toward the "non-state" view which explains hypnotic behavior on the basis of antecedent variables and demand characteristics rather than as being due to a trance state (Barber, 1958, 1959, 1961a, 1964a; Glass and Barber, 1961; Barber and Glass, 1962; Orne, 1959, 1966).

The literature review above would suggest that existing evidence with regard to the "state" versus "non-state" controversy is at best inconclusive due primarily to the variable of experimental controls. Adherents of the "non-state" view have been accused of actually hypnotizing their "waking controls" (Tart and Hilgard, 1966; Schneck, 1969). Findings with regard to subject variables are ambiguous. While some studies report no correlation between sex and hypnotic susceptibility (Weitzenhoffer and Weitzenhoffer, 1958; Hilgard and Bentler, 1963), others (Rosenhan and Tomkins, 1964) report a definite

relationship between desire to participate in a hypnosis experiment and hypnotizability for females, but not for males. Boucher and Hilgard (1962) and Melei and Hilgard (1964) found volunteers to be more highly susceptible to hypnosis than non-volunteers, but reported no sex differences in hypnotizability. The potency of experimenter bias in affecting experimental outcome is well known (Rosenthal, 1968; Barber and Silver, 1968) as are the demand characteristics of the experimental procedure (Orne, 1959; Bowers, 1967; Barber and Calverley, 1963b; Barber, 1964a). Most of the research reviewed paid little or no attention to the variable of experimenter bias. Further, whereas some research has shown that simply defining the situation as one involving hypnosis had an enhancing effect on suggestibility (Glass and Barber, 1961; Barber and Calverley, 1969), other research (Starr and Tobin, 1970) reported no relationship between the presence or absence of an expectation to be hypnotized and degree of suggestibility. Finally, a possibly very potent contaminating factor, uncontrolled in most of the research reviewed, is Kramer's recent finding (1969) that prior contact with the experimenter-hypnotist resulted in significantly higher hypnotic suggestibility.

The present study attempted to determine what would happen if Ss of high and low hypnotic susceptibility were given a suggestion both before induction and after induction (in which case the suggestion would operate as a posthypnotic suggestion) with the presentation order counterbalanced. Posthypnotic suggestion has been described above as one of the most infallible indicators that a trance state is genuine

(Pattie, 1956). According to LeCron and Bordeaux (1949, p. 124), the "most important of all hypnotic phenomena is posthypnotic suggestion, whereby we are able to transfer all the conditions of the trance to the waking state." Posthypnotic suggestion is also one of the higher order items of the Stanford Hypnotic Susceptibility Scale and is taken to reflect a deep, as opposed to mild, trance state.

Support for the "state" view of hypnotic behavior would require that Ss of high susceptibility respond more favorably to the suggestion when it followed the hypnotic induction procedure. Only following hypnotic induction could S be expected to be in a trance "state" and it is in such a "state" that suggestions are considered to have their greatest potency. A finding of no difference in response to the suggestion regardless of whether it preceded or followed the hypnotic induction would be supportive of the "non-state" position. Subjects of low hypnotic susceptibility were included as controls because of the order variable and they would be expected to be unresponsive to the suggestion regardless of the order of presentation.

METHOD

Selection of subjects: Twenty-four undergraduate female volunteers enrolled at Louisiana State University were included in the study. Females were used because they have been found to be more reliable than males in complying with the many time commitments required by this type of experiment (Dawson, personal communication) and past research has shown no sex determined differences in hypnotizability (Weitzenhoffer and Weitzenhoffer, 1958; Boucher and Hilgard, 1962; Hilgard and Bentler, 1963; and Melei and Hilgard, 1964).

The Minnesota Multiphasic Personality Inventory was administered along with a brief interview (Appendix A) in order to screen out volunteers with severe personality or medical problems. Potential Ss were then given items from the Stanford Hypnotic Susceptibility Scale (Appendix A) in three training sessions conducted by Dr. Dawson. Twelve high-susceptible and 12 low-susceptible Ss were selected by Dr. Dawson for inclusion in the study. High-susceptible Ss responded positively to at least 10 of the Susceptibility Scale suggestions, while low-susceptibility Ss responded favorably only to the suggestion that they close their eyes.

The Digit Symbol subtest of the Wechsler Adult Intelligence Scale (Wechsler, 1955) was administered along with a hypnosis questionnaire (Appendix B) regarding S's familiarity with and attitudes toward hypnosis.

Experimental procedure: A tape recorder was used to administer a standard hypnotic induction (Weitzenhoffer, 1957) and the suggestion to all Ss in order to reduce the possibility of E bias. Both the taped induction procedure and the suggestion were recorded by a co-experimenter with whom Ss had no previous verbal contact. Studies by Hoskovec, Svorad, and Lanc (1963) and Thorne and Beier (1968) had demonstrated the interchangeability of "live" and recorded hypnotic induction. The suggestion (Appendix C) was similar to that used by Gandolfo (1970), essentially telling S that her performance on the Digit Symbol test upon "awakening" from the "trance" would deteriorate compared to initial performance.

Subjects served as their own controls in the study, participating in both experimental phases, and the experimental procedures were counterbalanced. The experimental design is shown in Figure 1.

In the Stage 1 condition, 6 high-susceptible (High-S) Ss (Group A) and 6 low-susceptible (Low-S) Ss (Group B) heard the recorded suggestion followed by the hypnotic induction (cells A1 and B1, respectively). Also under the Stage 1 condition, 6 High-S (Group C) and 6 Low-S (Group D) Ss received the suggestion after (actually, incorporated into) the hypnotic induction (cells C1 and D1, respectively). The suggestion for these Ss was, essentially, a post-hypnotic suggestion. At the completion of the Stage 1 procedures, Ss were "awakened" from the "trance" and administered the Digit Symbol test.

In Stage 2, the order conditions were reversed. High-S (Group

FIGURE 1
Experimental Design

Susceptibility	Order	
	Stage 1	Stage 2
	Suggestion before induction	Suggestion after induction
Group A (High-S)	cell A1	cell A2
Group B (Low-S)	cell B1	cell B2
	Suggestion after induction	Suggestion before induction
Group C (High-S)	cell C1	cell C2
Group D (Low-S)	cell D1	cell D2

A) and Low-S (Group B) Ss who received the suggestion before trance induction in Stage 1 were next given the suggestion following the trance induction procedure (cells A2 and B2). Similarly, all Ss given the suggestion following hypnotic induction in Stage 1 (Groups C and D), received the suggestion before hypnotic induction in Stage 2 (cells C2 and D2). Subjects were again "awakened" and the Digit Symbol test was re-administered.

Before starting the tape recorder for Stages 1 and 2, E urged Ss to respond honestly to the recorded procedure and not to simulate. Subjects were seen in groups determined by their level of hypnotic susceptibility. Group assignment was made by the co-experimenter and E was blind with regard to the susceptibility level of Ss in the various groups. At the conclusion of the experiment, E conducted a short de-briefing session with all Ss.

RESULTS

S susceptibility (High-S and Low-S) conditions and order (suggestion before and suggestion after induction) conditions are represented by two 2 x 2 analysis of variance designs as shown in Table 1. The upper half of Table 1 represents one 2 x 2 analysis of variance design: cell A1 - Group A (High-S)/suggestion before induction; cell A2 - Group A (High-S)/suggestion after induction; cell B1 - Group B (Low-S)/suggestion before induction; and cell B2 - Group B (Low-S)/suggestion after induction. The lower half of Table 1 represents a second 2 x 2 analysis of variance design: cell C1 - Group C (High-S)/suggestion after induction; cell C2 - Group C (High-S)/suggestion before induction; cell D1 - Group D (Low-S)/suggestion after induction; and cell D2 - Group D (Low-S)/suggestion before induction. The left column of Table 1 shows mean scores for Ss in Groups A, B, C, and D on the initial or baseline administration of the Digit Symbol test. A summary of an analysis of variance of the baseline scores is shown in Table 2. There were no significant differences between groups in their baseline performance. t-tests between the 4 baseline means were similarly nonsignificant. Since the 4 experimental groups did not differ in initial performance on the Digit Symbol test, baseline scores were not utilized in computing the cell means in Table 1. Cell means represent S's actual scores on Digit Symbol in Stages 1 and 2 with lower scores indicating slower

TABLE 1
ANALYSIS OF VARIANCE DESIGNS WITH BASELINE MEANS,
CELL MEANS, AND OVERALL MEANS OF
DIGIT SYMBOL SCORES

Baseline	Susceptibility	Order		
		Stage 1	Stage 2	
		Before *	After **	
68.67	Group A (High-S)	60.17	59.67	59.92
74.83	Group B (Low-S)	78.83	79.17	79.02
		69.50	69.42	
		After**	Before*	
68.83	Group C (High-S)	51.50	73.50	62.50
66.33	Group D (Low-S)	69.50	75.83	72.66
		60.50	74.66	

* suggestion before induction

** suggestion after induction

TABLE 2
ANALYSIS OF VARIANCE OF BASELINE SCORES
FOR GROUPS A, B, C, AND D

Source	Sum of Squares	df	Mean Square	F
Between Groups	237.01	3	79.00	1.31 ns
Within Groups	1206.32	20	60.32	
TOTAL	1443.33	23		

ns nonsignificant difference

performance, higher scores indicating faster performance, and differences being attributed to the experimental treatments.

A summary of the analysis of variance for groups in the upper half of Table 1 (cells A1, A2, B1, and B2) is shown in Table 3 while Table 4 shows t-test comparisons between the cell means. Groups were found to differ significantly ($p < .01$) depending on their level of susceptibility with Group A (High-S) Ss responding favorably to the suggestion (resulting in slower Digit Symbol performance) compared to Group B (Low-S) Ss. No differences were found between groups on the basis of whether they received the suggestion before or after induction.

A summary of the analysis of variance for groups in the lower half of Table 1 (cells, C1, C2, D1, and D2) is shown in Table 5. A significant difference ($p < .05$) was found for the order factor (suggestion after or suggestion before induction), but not for the susceptibility factor. Table 6 shows t-test comparisons between cell means C1, C2, D1, and D2. High-S Ss were found to respond significantly slower ($p < .05$) when they initially received the suggestion following induction (cell C1), but not when the order was reversed and they received the suggestion before induction (cell C2). High-S Ss also responded significantly slower ($p < .05$) than Low-S Ss in Stage 1, but not in Stage 2, of the experiment.

Since all possible factor combinations are represented across Stage 1 of the design (cells A1, B1, C1, and D1), an analysis of variance was run between the Stage 1 cells as shown in Table 7.

TABLE 3
ANALYSIS OF VARIANCE FOR GROUPS IN UPPER HALF OF TABLE 1
(CELLS A1, A2, B1, AND B2)

Source	SS	df	MS	F	P
Susceptibility	2185.04	1	2185.04	16.60	<.01
Order	0.04	1	0.04	< 1	ns
Interaction	1.06	1	1.06	< 1	ns
Error	2631.82	20	131.59		
Total	4817.96	23			

ns nonsignificant

TABLE 4
t-TEST COMPARISONS BETWEEN CELL MEANS
A1, A2, B1, AND B2

	cell B1	cell A2
cell A1	**	ns
cell B2	ns	*

ns nonsignificant

* $p < .05$

** $p < .01$

TABLE 5
ANALYSIS OF VARIANCE FOR GROUPS IN LOWER HALF OF TABLE 1
(CELLS C1, C2, D1, AND D2)

Source	SS	df	MS	F	P
Susceptibility	620.16	1	620.16	4.10	ns
Order	1204.16	1	1204.16	7.96	<.05
Interaction	368.18	1	368.18	2.43	ns
Error	3027.33	20	151.37		
Total	5219.83	23			

ns nonsignificant

TABLE 6
t-TEST COMPARISONS BETWEEN CELL MEANS
C1, C2, D1, AND D2

	cell D1	cell C2
cell C1	*	*
cell D2	ns	ns

ns nonsignificant

* $p < .05$

TABLE 7
ANALYSIS OF VARIANCE FOR GROUPS ACROSS STAGE 1
(CELLS A1, B1, C1, AND D1)

Source	SS	df	MS	F	P
Susceptibility	2016.66	1	2016.66	21.79	<.01
Order	486.00	1	486.00	5.25	<.05
Interaction	0.68	1	0.68	<1	ns
Error	1850.66	20	92.53		
Total	4354.00	23			

ns nonsignificant

There were significant differences ($p < .01$ and $p < .05$) over the susceptibility and order factors, respectively. t-test comparisons between the cell means, Table 8, showed a significant difference ($p < .01$) between High-S and Low-S Ss receiving the suggestion before induction (cells A1 and B1) and a significant difference ($p < .05$) between High-S and Low-S Ss receiving the suggestion after induction (cells C1 and D1). In both instances, the High-S groups responded positively to the suggestion to slow down their Digit Symbol performance.

A summary of the analysis of variance across Stage 2 groups (cells A2, B2, C2, and D2) is shown in Table 9. No significant differences were found over either the susceptibility or the order factors. Table 10 shows t-test comparisons between cells A2, B2, C2, and D2. The only significant mean difference ($p < .05$) was between High-S and Low-S Ss who received the suggestion after induction (cells A2 and B2), the High-S group responding significantly slower on Digit Symbol than the Low-S group.

The first question on the hypnosis questionnaire (Appendix B), "I have read some articles and/or books concerning hypnosis," was the only one found to discriminate between high and low susceptibility Ss. Of the Low-S group, 11/12 responded "False" to this question, while the High-S group responded randomly. This finding would suggest that, in general, High-S Ss had more knowledge regarding hypnosis than Low-S Ss.

TABLE 8
t-TEST COMPARISONS BETWEEN CELL MEANS
A1, B1, C1, AND D1

	cell C1	cell B1
cell A1	ns	**
cell D1	*	ns

ns nonsignificant

* $p < .05$

** $p < .01$

TABLE 9
ANALYSIS OF VARIANCE FOR GROUPS ACROSS STAGE 2
(CELLS A2, B2, C2, AND D2)

Source	SS	df	MS	F	P
Susceptibility	715.04	1	715.04	3.76	ns
Order	165.37	1	165.37	< 1	ns
Interaction	442.06	1	442.06	2.32	ns
Error	3808.49	20	190.42		
Total	5130.96	23			

ns nonsignificant

TABLE 10
t-TEST COMPARISONS BETWEEN CELL MEANS
A2, B2, C2, AND D2

	cell C2	cell B2
cell A2	ns	*
cell D2	ns	ns

ns nonsignificant

* $p < .05$

DISCUSSION

Examination of the separate statistical analyses of the data in Table 1 suggests support for both the "state" and "non-state" explanations of hypnotic behavior. Tables 3 and 4, showing the analysis of variance and t-test comparisons of the data in the upper half of Table 1, indicate that High-S Ss responded positively to the suggestion regardless of whether it preceded or followed the hypnotic induction procedure. This finding would be predicted by the "non-state" view. The analyses summarized in Tables 5 and 6, indicate that High-S Ss responded positively to the suggestion only when it followed the induction procedure as predicted by "state" theory. The analysis of variance of the Stage 1 data (Table 7) revealed a significant order factor which could be explained by "state" theory, while mean comparisons of High-S Ss indicated compliance with the suggestion irrespective of the order of presentation in agreement with "non-state" theory. The Stage 2 comparisons, Tables 9 and 10, both show, in agreement with "non-state" theory, that High-S Ss did not differ significantly in response to the suggestion whether it was given before or after the induction procedure.

The apparently contradictory results of this study shed some light on why both "state" and "non-state" theorists have been able to generate research supportive of their respective positions. If the experimental groups depicted in the upper half of Table 1 had been the

only ones included in the design, the results would favor the "non-state" position. If, on the other hand, the design had included only those experimental groups shown in the lower half of Table 1, the results would have fallen neatly into the "state" camp.

Clearly, the order factor is a critical variable in determining the response produced by Ss with high hypnotic susceptibility. What appeared most crucial in determining the response of High-S Ss was not whether suggestion preceded or followed hypnotic induction but, rather, the suggestion-induction combination which first confronted S. In a situation defined as one involving hypnosis, good hypnotic Ss appeared ready to respond positively to the hypnotist's suggestion although they did not receive the suggestion while in a "trance state" (Group A-Stage 1 of Table 1). All 6 of these Ss slowed down in this situation compared to initial performance. Having had this initial experience, these same Ss, as a group, again responded positively to the suggestion when they received it while in a "trance state" (Group A-Stage 2 of Table 1). Individually, however, 2 Ss actually improved their Digit Symbol performance. On initially receiving the suggestion while in a "trance state" (Group C-Stage 1 of Table 1), good hypnotic Ss slowed their Digit Symbol performance both as a group and individually. As a group, their performance on Digit Symbol was unaffected by the suggestion when it was next given preceding the induction procedure (Group C-Stage 2 of Table 1). Individually, 4 Ss actually improved upon their initial Digit Symbol score while the other 2 Ss again responded positively to the suggestion, although not to the same

extreme as in Stage 1. Ss of low hypnotic susceptibility failed to respond to the suggestion regardless of the order of presentation or the initial suggestion-induction combination received.

A plausible explanation of the apparently contradictory results of this study may be found in the "non-state" view of hypnotic behavior. Indeed, from a "non-state" point of view, the results are not at all contradictory. In a situation identified as one involving hypnosis, the good hypnotic S appears set to respond positively to the hypnotist. Although S may have some initial knowledge regarding hypnotic behavior (as the hypnosis questionnaire indicated in the present case), he apparently relies solely on some initial cue from the hypnotist to determine the nature of his hypnotic response. When the initial cue to Ss in Group A was the suggestion that their Digit Symbol performance would deteriorate, they complied with no exceptions. Some of these same Ss were apparently so perplexed by the reversed conditions of Stage 2 that they not only failed to comply with the suggestion, but actually improved their performance. Group C Ss initially learned that they would enter a "trance state" following which they would receive a suggestion (with which they complied without exception). Again, however, when the conditions were reversed in Stage 2, their response was no longer unanimous.

It seems plausible to conclude that highly susceptible individuals not in a "state" of trance will readily comply with the hypnotist's suggestions if they have not been "taught" that the induced trance "state" must necessarily precede such compliance. The trance

induction procedure is primarily a series of repetitive suggestions aimed at inducing S to voluntarily transfer volitional control to the hypnotist. S's very ability to thus enter a trance "state" would seem to confirm that achievement of such a "state" is a superfluous variable in the suggestion-response chain. The primary conclusion of this study is that the trance "state" is an unnecessary concept in explaining hypnotic behavior. Although the study was not designed to test a specific "non-state" theory, the results appear consistent with Barber's views (1964a, 1969, 1970) that hypnotic behavior is dependent on the particular antecedent variables involved and Orne's position (1959) that hypnotic behavior is determined by the demand characteristics of the situation.

The finding of no gross differences between the responses of high- and low-susceptibility Ss to the hypnosis questionnaire (except for some indication that the High-S group had more initial knowledge regarding hypnosis) may be added to the failure of other researchers (London, 1962; Zamansky and Brightbill, 1965) to identify differences in such Ss with regard to interests, experiences or attitudes toward hypnosis.

Future research on the demand characteristics variable of hypnotic behavior could relate initial survey questions regarding S's interests, experiences and attitudes toward hypnosis more specifically to the research design than was the case in the present study. S's questionnaire responses could then be correlated with performance under a variety of demand characteristics in order to determine the

relative strength of each variable.

One of the most perplexing problems facing future researchers in the area of hypnosis deals with the issue of the "ideal" response measure. How does one measure S's compliance or lack of compliance to hypnotic suggestion? Should the research design be such that S is unaware of the response being measured or does the desirability of such a control depend on the question under study? In the present study, for example, it is believed that the Digit Symbol response was adequate for the purpose of exploring the necessity of the trance "state" concept per se. What, however, would have been the outcome had Ss been unaware of the behavior being measured? The most compelling evidence regarding the nature of hypnotic behavior could perhaps depend on requiring a high cost in terms of personal sacrifice for Ss to comply with a hypnotic suggestion. This final issue abounds with ethical, moral and legal considerations.

SUMMARY

The present study sought to determine the importance of the trance "state" as an explanatory concept in hypnosis. Ss of high and low hypnotic susceptibility were presented a suggestion both before and after a hypnotic induction procedure in a counterbalanced design. Ss served as their own controls in the two phases of suggestion-induction presentation. The order of the induction procedure determined whether or not S received the suggestion while in a trance "state."

Ss of low hypnotic susceptibility failed, as predicted, to comply with the suggestion irrespective of the order condition. High susceptibility Ss initially receiving the suggestion before induction and then in reverse order responded positively to both presentations. High susceptibility Ss who initially received the suggestion after induction and then in reverse order responded positively only to the initial presentation. Ss responses appeared to be determined by whether or not they initially learned that a trance "state" was necessary for compliance with the suggestion. The results were taken as supportive of "non-state" theory and Ss' responses to suggestions were explained in terms of demand characteristics and antecedent variables.

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A P P E N D I C E S

APPENDIX A

HYPNOSIS SCREENING BATTERY

Name _____ Phone _____

When available _____

Why did you volunteer? _____

Based on what you know and what you have heard about hypnosis, what do you think you will experience when hypnotized? _____

Have you in the past had any severe medical problems? Any present chronic illness? (Inquire as to heart disorder, blood pressure, fainting spells, rheumatic or scarlet fever, brain damage.) _____

Have you ever been administered chemical anesthetics such as ether, sodium pentathol? Did you have any adverse effects such as struggling when going under, required repeated administrations before anesthetic could take effect, or afterwards severe nausea or headache? _____

Have you ever sought psychiatric help? _____

Do you tend to be a nervous person? _____

Have you ever had thoughts you were ashamed of? _____

Have you smoked pot, taken LSD, pills such as barbituates or amphetamines, or any drug considered to be hallucinogenic? (Determine frequency, if yes.) _____

Have you ever had prolonged periods of being depressed? _____

Have you ever been robbed of your thoughts? _____

Are you often moody, tend to have ups and downs, days you just feel "down in the dumps?" _____

Do you find it very easy to become so completely absorbed in a book
or a movie you like that you become unaware of what's going on
around you?_____

Do you like (do you think you would like) flying in an airplane?_____

What, in particular, could scare you about flying?_____

Is it (would it be) easy for you to trust the pilot?_____

ITEMS IN THE STANFORD HYPNOTIC SUSCEPTIBILITY SCALE,
FORMS A AND B (WEITZENHOFFER AND HILGARD, 1959)

Item	Form A	Form B	Criterion of passing
1. Postural sway	Backwards	Backwards	Falls without forcing
2. Eye closure	Form A induction	Form B induction	Eyes close without forcing
3. Hand lowering	Left	Right	Lowers at least 6 inches by end of 10 seconds
4. Arm immobilization	Right arm	Left arm	Arm rises less than 1 inch in 10 seconds
5. Finger lock	Before chest	Overhead	Incomplete separation of fingers at end of 10 seconds
6. Arm rigidity	Left arm	Right arm	Less than 2 inches of arm bending in 10 seconds
7. Moving hands	Together	Apart	(A) Hands close as 6 inches (B) Hands apart at least 6 inches
8. Verbal inhibition	Name	Home town	Name unspoken in 10 seconds
9. Hallucination	Fly	Mosquito	Any movement, grimacing, acknowledgement of effect
10. Eye catalepsy	Both eyes closed	Both eyes closed	Eyes remain closed at end of 10 seconds
11. Posthypnotic	Changes chairs	Rises, stretches	Any partial movement response at signal
12. Amnesia	Recall of items 3-11	Recall of items 3-11	Recall of three or fewer items

Technical Data on SHSS

The SHSS has been standardized at Stanford and has been shown to be a reliable instrument (Hilgard, 1965). The mean items passed by 533 Stanford students was 5.62 with a standard deviation of 3.27. Retest reliabilities using different hypnotists and alternate forms over two days of testing ranged from .91 to .95 for different samples.

APPENDIX B
HYPNOSIS QUESTIONNAIRE

- T F 1. I have read some articles and/or books concerning hypnosis.
- T F 2. I have never seen anyone hypnotized.
- T F 3. People can be hypnotized against their will.
- T F 4. People usually forget what happened during the trance as soon as they wake up from it.
- T F 5. In hypnosis, people have greater mental abilities than ordinarily, so that they can learn more easily and quickly than usual.
- T F 6. It is difficult for a person, upon awakening from a trance, to resist obeying a posthypnotic suggestion.
- T F 7. Hypnosis is an unconscious state, so hypnotized people are not aware of what they are doing during the trance.
- T F 8. The more generally suggestible people are, the more easily they can be hypnotized.

APPENDIX C

THE SUGGESTION

If you remember, a while back, you took the Digit Symbol test. This was a test that had a number of boxes with numbers in the upper part, and spaces in the lower part. If you remember, you filled in the spaces below the numbers with the marks that should go there. Well, you're going to take this test again, as a matter of fact, shortly after you are awakened. However, this time when you take the test, your hand, your writing hand, is going to undergo some strange experiences. It's going to feel very, very stiff, very rigid. Your whole hand is going to feel very stiff and rigid. Your fingers are going to feel very, very stiff, very rigid. Your whole hand is going to feel very, very heavy. It's going to be very, very difficult for you to hold onto a pencil, because your hand will feel so stiff, your fingers so stiff and rigid. It will be very hard to write. You will wonder how you could possibly even pick up a pencil. You will find it extremely difficult to hold onto a pencil and to write. Your fingers are going to feel so stiff, they're going to feel so rigid. Your hands and your fingers are going to feel very stiff and very rigid. When you are told to take the Digit Symbol test, your hand is going to undergo all these strange experiences. It's going to be very, very hard for you to take this test, very, very difficult, very difficult. As a matter of fact, you will have to go very slowly when you take this test. Otherwise, you will make too many mistakes. You will have to go very, very slowly. Your hand will feel very, very

funny. Your fingers will feel so rigid, your hand will feel so heavy, the pencil will feel like a foreign object in your hand. You will find it very, very difficult to take the test. You will be so worried about the way your hand feels that it will be difficult for you to concentrate on the test. Your hand will be a lot more important to you than taking the test. You will be worried about the way your hand feels, the way your fingers feel so stiff and so rigid, like pieces of wood. The way your hand is heavy, the way it is hard for you to hold onto a pencil, the way it is hard for you to write. You will be very worried about the way your hand feels, and you will not be able to concentrate very well on the test. You will have to go very slow on the test to avoid making mistakes, extremely slow. It'll be very, very difficult for you to take the test. It will take you a long time to complete it. You will have to go very slowly and carefully, making sure you haven't made mistakes, making sure you can form the symbols. It will be very, very slow.

As soon as you finish taking the Digit Symbol test, your hand will return to normal and feel fine again. But while you are taking the Digit Symbol test, your hand will undergo these strange experiences and feel very, very funny. Immediately after you finish with the test, your hand will feel quite normal again, but not until you've finished. While you are taking the test, your hand will feel very, very strange, and very funny, and you will worry about it, and you will find that you will have to go very, very slowly on this test.

VITA

Gus Nicolaos Hangiandreou was born August 22, 1935 in Beloit, Wisconsin. He attended Beloit public schools and received his undergraduate degree in mathematics from Beloit College in June, 1961. The author entered the graduate program at Louisiana State University in September, 1961 and received his M. A. degree in psychology in August, 1963. Following a one year clinical internship at the VA psychiatric hospital in Gulfport, Mississippi, he worked as a staff psychologist at Willmar State Hospital in Willmar, Minnesota, returning to Baton Rouge in 1967. He is currently employed at the Baton Rouge Mental Health Center.

The author married the former Susan Brownell, also from Beloit, and is the father of three children.

EXAMINATION AND THESIS REPORT

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Major Field: Psychology

Title of Thesis: "A Test of the 'State' versus 'Non-State' Views of Hypnotic Behavior"

Approved:

Joseph G. Dawson
Major Professor and Chairman

Max Goodrich
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EXAMINING COMMITTEE:

Berry H. Proctor

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Date of Examination:

June 16, 1971